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U. S. FOREST PRODUCTS LABORATORY

MADISON, WISCONSIN.

LIST OF PUBLICATIONS JANUARY 1 TO JUNE 30, 1939

Publications available for distribution at the Laboratory are marked with an asterisk (*). Blanket requests for publications will not be filled. Publications not marked with an asterisk are available as noted after the title.

Trade journals and magazines referred to, if not available in your local library, may be obtained from publishers listed on the last page.

Chemistry of Wood and Derived Products

Composition of holocellulose, hydrolyzed holocellulose, and Cross and Bevan cellulose, by W. G. Van Beckum and G. J. Ritter. Paper Trade Jour., Feb. 16, 1939.

Crystal arrangement and swelling properties of fibers and ray cells in basswood holocellulose, by G. J. Ritter and R. L. Mitchell. Paper Trade Jour., Feb. 9, 1939.

*Effect of various pre-extractions on the lignin determination of wood, by E. E. Harris and R. L. Mitchell. Indus. & Eng. Chem., Analyt. Edition, Mar. 15, 1939.
Same. Mimeo. R1204.

*Reactions of lignin with hydrogen, by E. E. Harris and Homer Adkins. Paper Trade Jour., Nov. 17, 1938.
Same. Mimeo. R1201.

*Wood plastics as developed at the Forest Products Laboratory and their future importance, by E. C. Sherrard. Mimeo. R1209, June 1939.

Wood plastics, their development and future importance, by E. C. Sherrard. Michigan Forester, 1939.

Coatings

Open letter about formula labeling, by F. L. Browne. Natl. Paint Bul., May 1939.

Painting your house, by F. L. Browne. Amer. Forests, May 1939.

*What can be done to make paint maintenance more successful, by F. L. Browne. South. Lbrman., Feb. 1, 1939.
Same. Mimeo. R1198.

Glue and Plywood

- *Contributions of synthetic resins to improvement of plywood properties, by Don Brouse. Mimeo. (unnumbered), Jan. 1939.

Pulp and Paper

- *Contributions of Forest Products Laboratory research to southern pulp and paper developments, by C. P. Winslow. Amer. Paper & Pulp Assn. Monthly Review, May-June 1939.
Same. Mimeo. R1206.

Effect of the addition of sodium salts in pulping shortleaf pine with neutral sodium sulphite liquor, by G. H. Chidester and J. N. McGovern. Paper Trade Jour., Feb. 9, 1939.

Forest Products Laboratory springwood-summerwood measuring instrument, by J. C. Pew and E. R. Schafer. South. Pulp & Paper Jour., Jan. 1939.

Forest products research in the pulping of western woods, by C. E. Curran. Pacific Pulp & Paper Indus., June 1939.

Methods of integrating concentric ring areas, by E. R. Schafer and J. C. Pew. Instruments, May 1939.

- *Production of loblolly pine pulpwood in the mid-Atlantic region, by J. B. Cano. South. Pulp & Paper Jour., Pt. 1, Mar. 1939; Pt. 2, May 1939.

Seasoning of Wood

Air seasoning of eastern hemlock lumber with reference to building construction, by J. S. Mathewson. Northern Hemlock & Hardwood Mfrs. Assn., May 5, 1939.

- *Electrical moisture meters for wood, by M. E. Dunlap. Revised Mimeo. R1146, Feb. 1939.

Moisture and shrinkage relationships in wood, by R. C. Rietz. Cold Storage Locker Operator's Conference Proc. 1939.

Wood Pathology

- *Further studies on temperatures necessary to kill fungi in wood, by M. S. Chidester. Amer. Wood-Pres. Assn. Proc. 1939.

Wood Structure

Variation in the specific gravity of the springwood and summerwood of four species of southern pines, by B. H. Paul. Jour. Forestry, June 1939.

Wood in Construction

*Bearing strength of wood at angle to the grain, by J. A. Newlin. Eng. News-Record, May 11, 1939.
Same. Mimeo. R1203.

*Condensation problems in modern buildings, by L. V. Teesdale. Lumber Cooperator, Mar. 1939.

Same. Bldg. Supply News, Apr. 1939.

" Northwest Arch., Mar.-Apr. 1939.

" Ill. Soc. Archs. Monthly Bul., June-July 1939.

" Heating & Ventilating, Air Conditioning, Apr. 1939.

" Mimeo. R1196.

Fiberboard sheathing, by G. E. Heck. Wood Construction, Jan. 15, 1939.

Insulation and vaporproofing of cold storage buildings, by L. V. Teesdale. Cold Storage Locker Operator's Conference Proc. 1939.

*Strength of bolted timber joints, by J. A. Scholten. Eng. News-Record, May 11, 1939.
Same. Mimeo. R1202.

The work of the Forest Products Laboratory in relation to trends in the use of wood in construction, by C. P. Winslow. Wood, June 1939.

Wood Preservation

*Corrosion of metal fastenings in zinc-chloride treated wood after 10 years, by R. H. Baechler. Amer. Wood-Pres. Assn. Proc. 1939.

International termite exposure test: 10th progress report, by G. M. Hunt and T. E. Snyder. Amer. Wood-Pres. Assn. Proc. 1939.

*Method for determining chlorinated compounds dissolved in petroleum oils, by R. H. Baechler. Amer. Wood-Pres. Assn. Proc. 1939.

*Toxicity of normal aliphatic alcohols, acids, and sodium salts, by R. H. Baechler. Amer. Wood-Pres. Assn. Proc. 1939.

*Use of chemicals in forest fire control, by T. R. Truax. Mimeo. R1199, Apr. 1939.

Wood Utilization, Logging, and Milling

- *Further experiments in the planing of hardwoods, by E. M. Davis.
Amer. Soc. Mech. Eng. Trans., Feb. 1939.
Same. Mimeo. R1195.

Lumber consumption trends in the furniture industry, by R. P. A. Johnson. Hardwood Record, Jan. 1939.
Same. (Editorial) Amer. Lbrman., Jan. 28, 1939.

- *Markets for New England's wind-felled forests, by C. P. Winslow. Amer. Forests, Mar. 1939.

Species of wood suitable for use in contact with foodstuffs, by R. P. A. Johnson. Cold Storage Locker Operator's Conference Proc. 1939.

Sustained markets as a vital factor in logging: Some research trends, by C. P. Winslow. Comite Internatl. du Bois, Internatl. Rev. on Timber Utilization, May 1939.

Publishers of Trade Journals and Magazines Included in References

Amer. Forests, 919 - 17th St., NW., Washington, D. C.
Amer. Lbrman., 431 S. Dearborn St., Chicago, Ill.
Amer. Paper & Pulp Assn., 370 Lexington Ave., New York City.
Amer. Soc. Mech. Engrs., 29 W. 39th St., New York City.
Amer. Wood-Pres. Assn., 1427 Eye St., NW., Washington, D. C.
Bldg. Supply News, 59 E. Van Buren St., Chicago, Ill.
Cold Storage Locker Operators, Col. of Agr., Univ. of Wis., Madison, Wis.
Comite Internatl. du Bois, 50 Rue Neuve, Brussels, Belgium.
Eng. News-Record, 330 W. 42nd St., New York City.
Hardwood Record, 537 S. Dearborn St., Chicago, Ill.
Heat. & Ventilating, Air Conditioning, 148 Lafayette St., New York City.
Ill. Soc. Archs. Monthly Bul., 520 N. Michigan Ave., Chicago, Ill.
Instruments, 1117 Wolfendale St., North Side Sta., Pittsburgh, Pa.
Indus. & Eng. Chem., Mills Bldg., Washington, D. C.
Jour. Forestry, 839 - 17th St., NW., Washington, D. C.
Lumber Cooperator, 82 St. Paul St., Rochester, N. Y.
Michigan Forester, Univ. of Mich., Ann Arbor, Mich.
Natl. Paint Bul., Natl. Press Bldg., Washington, D. C.
Northern Hemlock & Hardwood Assn., Oshkosh, Wis.
Northwest Architect, 2642 University Ave., St. Paul, Minn.
Pacific Pulp & Paper Indus., 71 Columbia St., Seattle, Wash.
Paper Trade Jour., 15 W. 47th St., New York City.
South. Lbrman., Presbyterian Bldg., Nashville, Tenn.
South. Pulp & Paper Jour., Mortgage Guarantee Bldg., Atlanta, Ga.
Wood, 33 Tothill St., Westminster, London, S.W.1, England.
Wood Construction, Xenia, Ohio.

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LIST OF PUBLICATIONS JULY 1 TO DECEMBER 31, 1939

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Trade journals and magazines referred to, if not available in your local library, may be obtained from publishers listed on the last page.

Chemistry of Wood and Derived Products

Arrangement of the cellulose in ray cells of white oak as determined by X-rays, by S. T. Gross, G. L. Clark, and G. J. Ritter. Paper Trade Jour., Dec. 7, 1939.

The X-ray data are a confirmation of the microscopical data which indicate that the cellulose crystallites are arranged in the vertical crosswise direction of the ray cells.

Resin-treated plywood, by A. J. Stamm and R. M. Seborg. Indus. & Engin. Chem., July 1939.

The formation of phenol-formaldehyde resins within the cell walls of veneer reduces the swelling and shrinking, increases decay and acid resistance, increases compressive mechanical properties, and greatly reduces face checking of and moisture transfusion through plywood made therefrom.

*Unidirectional drying of wood, by E. Bateman, J. P. Hohf, and A. J. Stamm. Indus. & Engin. Chem., Sept. 1939. Same, Mimeo. R1216.

Rate of drying and moisture gradient measurements show that drying follows the diffusion law. Changes in the rate of diffusion with changes in moisture content, boundary conditions, temperature, atmospheric pressure, and specific gravity of the wood are calculated.

Yield and viscosity of holocellulose and some of its cellulosic fractions, by W. G. Van Beckum and G. J. Ritter. Paper Trade Jour., Nov. 30, 1939. Summary in Paper Indus. & Paper World, Oct. 1939.

The alpha cellulose obtainable from holocellulose surpasses in both yield and quality the alpha cellulose recoverable from other wood cellulose fractions.

Containers

Plywood in relation to the veneer package industry, by C. V. Sweet. Wood Products, Dec. 1939.

A general summary of trends in the use of plywood, and factors influencing its production by veneer package manufacturers.

*A study of corrugated fiberboard and its component parts as engineering materials, by T. A. Carlson. Fibre Containers, July 1939.

Data are presented on the strength and stiffness of paperboard as determined by means of a special technic, using an optical strain gage and careful humidity control. The findings are correlated with the strength of corrugated board as determined by static bending, column, and shear tests.

Pulp and Paper

*Average yields of wood pulp from various species of wood. Forest Products Laboratory Tech. Note 191. Revised Dec. 1939.
Contents indicated by title.

Comparative resistance to vapor transmission of commercial building papers, by M. Heinig, L.V. Teesdale, and C.E. Curran. TAPPI Tech. Papers, 1939.

Commercial building papers were classified into four general types for determination of their suitability for moisture barriers in house construction. All the papers in one class were found unsatisfactory; in two classes some papers were satisfactory, others unsatisfactory. The most satisfactory class was the asphalt-saturated and-coated sheathing papers.

Comparison of calcium with sodium base liquors in sulphite pulping, by J. N. McGovern and G. H. Chidester. Amer. Pulp & Paper Mill Supts. Assn. Yearbook, 1939.

The cooking of white spruce, western hemlock, cypress, Douglas fir, and jack, loblolly, and slash pines with both sodium and calcium base sulphite liquors are discussed in regard to liquor composition and concentration and pulp yield, strength, and bleachability. Certain results favoring the sodium base liquor are pointed out.

Cross-section dimensions of fibers in relation to papermaking properties of loblolly pine, by J. C. Pew and R. G. Knechtges. South. Pulp & Paper Jour., Sept. 1939. Summary in Paper Indus. & Paper World, Oct. 1939.

Slow-growth pine, on the average, has thicker-walled summerwood fibers than fast-growth. Considerable variation exists in the fiber wall thicknesses of both springwood and summerwood of trees in the same growth rate class. These variations are indicated by the relation between the springwood-summerwood ratio and the specific gravity.

Discoloration of swamp black gum pulpwood in storage, by E. R. Schafer, J. C. Pew, and M. Y. Pillow. TAPPI Tech. Papers, 1939.

The light-colored sapwood in freshly cut swamp black gum discolors in less than 2 months if stored in a warm, moist place. The color change does not occur when the wood is rapidly dried. For groundwood best practice would be to pulp the wood soon after cutting.

Drainage characteristics of pulps and stuffs: I, Effect of acids and other electrolytes on freeness, by S. R. Adams, F. A. Simmonds, and P. K. Baird. TAPPI Tech. Papers, 1939. Summary in Paper Indus. & Paper World, Apr. 1939.

Freeness of stuffs is increased by presence of acids and certain other electrolytes, but not by alkalies. Effect varies with amount and nature of the cation, and nature of the stuff; valence rather than hydrogen ion concentration appears to be the controlling factor. Freeness increases with the valence of the cation.

Effect of rate of feed of wood to stone at various stone surface speeds in the groundwood process, by E. R. Schafer and J. C. Pew. Paper Trade Jour., Oct. 12, 1939. Summary in Paper Indus. & Paper World, Oct. 1939.

With a fixed ratio of surface speed to wood advance, increase in speed caused production of lower strength pulps without much change in unit energy consumption. Decreasing the wood advance rate at a constant stone speed caused decrease in pulp freeness and decrease in strength, unit energy consumption, and production rate.

Effect of the wood-stone contact area in the groundwood process, by E. R. Schafer and J. C. Pew. Paper Trade Jour., Nov. 16, 1939. Summary in Paper Indus. & Paper World, Oct. 1939.

Increasing the area to a certain point improved pulp properties and operating efficiency. The results suggest that the intimacy of contact between the wood and stone is affected by the magnitude of the contact area even when the unit pressure remains the same. This is of interest in grinder design.

Growth factors influencing the value of jack pine for kraft and sulphite pulps, by G. H. Chidester, M. W. Bray, and C. E. Curran. Paper Trade Jour., Sept. 28, 1939. Summary in Paper Indus. & Paper World, Oct. 1939.

An extensive study of selected cuttings by both processes with regard to the effect of diameter breast high, rate of growth, and position in the tree gave results which promise wider utilization of this species. Proper segregation of wood should be advantageous in the production of products having specific properties.

Growth rate and position of wood in tree as factors influencing kraft and sulphite pulps from jack pine, by G. H. Chidester, M. W. Bray, and C. E. Curran. Jour. Forestry, Sept. 1939.
See above abstract.

*Methods used at the Forest Products Laboratory for chemical analysis of pulps and pulpwoods, by M. W. Bray. Forest Products Laboratory Mimeo. R19, revised Sept. 1939.
Contents indicated by title.

Properties of wet fiber mats: relation of recovery from compressive deformation to sheet properties, by C. O. Seborg, F. A. Simmonds, and P. K. Baird. Paper Trade Jour., Aug. 24, 1939. Same, TAPPI Tech. Papers, 1939.

The phenomenon of recovery of a wet mat of pulp from compressive deformation, which is associated with fiber stiffness, has been correlated with the strength properties of test sheets over the freeness range normally used in papermaking. Possibility of predicting sheet properties from a wet pulp property is indicated.

Sulphate pulping of silver fir: effect of chemical concentration and of wood selection on yield and pulp quality, by M. W. Bray, J. S. Martin, and S. L. Schwartz. Pacific Pulp & Paper Indus., Sept. 1939. Same, Paper Trade Jour., Nov. 2, 1939.

Indirect heating and an initial total chemical concentration of 50 grams per liter produced optimum yields of pulp with highest strengths. For high pulp strength, wood from the upper portion of the trunk was better than wood from butt logs. All sapwood was better than wood consisting mostly of heartwood.

Sulphate pulping of southern yellow pines, II: effect of growth variables on yield and pulp quality, by M. W. Bray, J. S. Martin, and S. L. Schwartz. South. Pulp & Paper Jour., Nov. 1939.

Provided other properties do not interfere, the springwood-summerwood ratio is a criterion in predicting physical properties of the sulphate pulps. Certain wood properties appear to cause poorer strength. Proper selection of raw material is emphasized. Possibility of utilizing logs cut from above the merchantable saw timber length is shown.

Sulphidity effect in the sulphate pulping of Douglas fir, by M. W. Bray, J. S. Martin, and S. L. Schwartz. Paper Trade Jour., Oct. 26, 1939. Same, TAPPI Tech. Papers, 1939.

Replacing caustic soda with sodium sulphide from 0 to 100 percent sulphidity with constant initial alkalinity causes a progressive decrease in yield and bleach requirement up to 34 percent sulphidity. Further increases produce only slight changes. Besides any buffering action sodium sulphide is specifically reactive toward lignin.

Seasoning of Wood

*Chemical seasoning of overcup oak, by W. K. Loughborough. South. Lbrman., Dec. 15, 1939.

Detailed seasoning processes are described. Soaking diffuses salt into the green overcup oak, which is subsequently air dried and kiln dried. Results show that this species, which normally degrades so badly during drying that it is rarely cut, can by chemical seasoning be seasoned with little degrade.

Seasoning of wood, by J. S. Mathewson. Indus. Arts & Voca. Education, Sept. 1939.

A short discussion of moisture-shrinkage relationships in wood, causes of and methods of minimizing seasoning defects, correct moisture-content values of wood for various purposes, and benefits from air seasoning and kiln drying.

Wood in Construction

The glued laminated wooden arch, by T. R. C. Wilson. U. S. Dept. Agr. Tech. Bul. 691, Oct. 1939. 20¢. Govt. Printing Office, Washington, D. C.

Test data are presented on new type of construction consisting of arches and other curved as well as straight members made by bonding boards or laminations with water-resistant glue. Recommendations for design stresses and construction practice are also given, as well as a brief discussion of arch theory.

Structural properties of conventional wood-frame construction for walls, partitions, floors, and roofs, by G. E. Heck. U. S. Natl. Bur. Standards Building Material & Structures Report 25, 1939.

Strength, rigidity, and other properties of various wood frame house units were determined at the Forest Products Laboratory. The data are presented for comparison with similar data on other types or proposed new types of construction issued by the National Bureau of Standards in other publications of the same series.

Use and abuse of wood in house construction, by R. P. A. Johnson and E. M. Davis. U. S. Dept. Agr. Misc. Pub. 358, 1939. 10¢. Govt. Printing Office, Washington, D. C.

A popular, pictorial guide in the use of wood in house construction, based on a survey of 600 houses under construction. Discusses foundations, framing, nailing, openings, braces, cut-aways, proper moisture content of lumber, roofing materials, roof protection, drainage outlets and ventilation, quality lumber.

Wood Pathology

Mineral stain in hard maples and other hardwoods, by T. C. Scheffer. Jour. Forestry, July 1939.
Contents indicated by title.

Wood Preservation

*Preservation of timber by the steeping process, by R. M. Wirka. Forest Products Laboratory Mimeo. R621, revised Aug. 1939.

Describes treatment of wood by long soaking in water solutions of preservative salts in open tanks.

Wood Structure

- *Characteristics of ash from southern bottomlands, by M. Y. Pillow. South. Lbrman., Dec. 15, 1939.

Differences between extremely low and high strength properties of ash wood were found to be associated primarily with relative widths of fiber walls and cavities and orientation of strands of material composing the walls, which in turn were associated with variations in site.

- Heredity versus environment in improving wood in forest trees, by Arthur Koehler. Jour. Forestry, Sept. 1939.

Within a tree species there is more evidence of hereditary variation in external characteristics than in the wood. The quality of the wood, however, varies greatly with environment. Improvements in wood quality, therefore, are more likely to be obtained through modification of environment than through breeding.

- *Outlook for the chemical utilization of wood, by Arthur Koehler. South. Lbrman., Dec. 15, 1939.

Chemical utilization of wood is important in growing and converting timber because it can utilize forest and mill waste, but constitutes less than 8 percent of total volume, and still less of total value, of domestic consumption. This leaves wood in other forms as by far the most important source of forest revenue.

- Shrinkage of white oak as affected by position in the tree, by B. H. Paul. Jour. Forestry, July 1939.

Studies of old-growth white oak from the Cumberland Mountains in Tennessee showed that shrinkage of the wood increases with its age in the tree, that is, the wood near the center and base of the tree shrinks more in older than in younger trees.

Wood Utilization, Logging, and Milling

- Trends and needs in modern wood utilization, by C. P. Winslow. Jour. Forestry, Sept. 1939.

Points out profitable utilization of the forest crop is necessary for the practice of forestry; that present utilization practices are wasteful and inefficient; that there are two basic ways to meet the problem -- by an adequate program of utilization research, and by means of education and extension.

- *Wooden rosin barrels, by J. B. Cuno. Forest Products Laboratory Misc. Mimeo. 1939.

Discusses the advantages to naval stores people of continued use of the wooden rosin barrel, describes weaknesses in the present type because of shrinkage, improper wood, faulty manufacture and assembly, and gives detailed recommendations with several illustrations, for an improved wooden barrel.

*Woods and mill studies of the manufacture of birch, beech, and maple lumber in the Northeast. Forest Products Laboratory Mimeo. R1217, Dec. 20, 1939.

Deals with costs of logging and milling northeastern hardwoods; shows the influence of size of timber on production rates and costs, on lumber grade yields and values.

Miscellaneous

Effect of five kiln temperatures on the germinative capacity of long-leaf pine seed, by R. C. Rietz. Jour. Forestry, Dec. 1939.

The results of an experiment in the heating of relatively green longleaf pine cones indicate that seed viability is impaired if a kiln temperature in excess of 115° F. is used.

Products of American forests, by J. A. Hall and T. J. Mosley. U. S. Dept. Agr. unnumbered publication. 1939. 20¢. Govt. Printing Office, Washington, D. C.

Discusses the importance of forest resources; their proper utilization. Enumerates principal primary uses of wood, also products of wood conversion (pulp and paper, rayon, lignin, and wood flour products, sugar, ethyl alcohol, wood distillation products, etc.); seasonal crops and extractive materials, such as turpentine and rosin, maple sugar, tannins, dyestuffs, nuts, pharmaceuticals, volatile oils.

Recent developments in the search of new uses of wood, by C. P. Winslow and Arthur Koehler. Pub. in Assn. of Southern Agr. Workers "Forestry in Relation to Agriculture," 1939. Issued by Southern Region, U. S. Forest Service, Glenn Bldg., Atlanta, Ga.

Briefly outlines some of the recent research activities of the Forest Products Laboratory in such fields as prefabricated plywood house construction, glued laminated construction, antishrink treatments of wood, improved pulping methods, development of a new plastic material from sawdust, conversion of lignin into new products.

Publishers of Trade Journals and Magazines Included in References

American Pulp & Paper Mill Supts. Assn., Miamisburg, Ohio.
Fibre Containers, 228 N. LaSalle St., Chicago, Ill.
Indus. Arts & Voca. Education, 540 N. Milwaukee St., Milwaukee, Wis.
Indus. & Engin. Chem., Mills Bldg., Washington, D. C.
Jour. Forestry, 839 - 17th St., NW., Washington, D. C.
Pacific Pulp & Paper Indus., 71 Columbia St., Seattle, Wash.
Paper Indus. & Paper World, 59 E. Van Buren St., Chicago, Ill.
Paper Trade Jour., 15 W. 47th St., New York City.
South. Lbrman., Presbyterian Bldg., Nashville, Tenn.
South. Pulp & Paper Jour., Mortgage Guarantee Bldg., Atlanta, Ga.
TAPPI, Tech. Assn. of the Pulp & Paper Industry, 122 E. 42nd St.,
New York City.
U. S. Dept. of Agriculture publications (if not starred) to be purchased at the prices indicated from the Superintendent of Documents, Government Printing Office, Washington, D. C.
Natl. Bureau of Standards, U. S. Dept. of Commerce, Washington, D. C.
Wood Products, 431 S. Dearborn St., Chicago, Ill.